

REMARKS

This responds to the Office Action mailed on May 19, 2005.

Claims 79 is amended, no claims are canceled, no claims are added; as a result, claims 1, 4-17, 21, 22, 24, 27-29, 32-35, 37-39, 41-43, 45-57, 59-65 and 77-79 are now pending in this application.

§112 Rejection of the Claims

Claim 79 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is believed the amendment to claim 79 obviates this rejection.

Reconsideration and withdrawal of this rejection is respectfully requested.

§103 Rejection of the Claims

Claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65

Claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Yivisaker et al. (U.S. 4,964,259). This rejection is respectfully traversed.

The Office Action asserts that Beer, Thompson ('990), Francis, Maglecic, McCrosson and Yivisaker teach various aspects of the claimed invention.

Applicant respectfully submits that the Office Action has not established the *prima facie* obviousness of the present claims. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on

applicant's disclosure. MPEP 2142 (citing In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Furthermore, claims 10, 12, 15, 27-29, 41, 42, 59-61 and 65 are dependent claims. The additional limitations provided in dependent claims cannot by themselves be rendered obvious over the cited references if the independent claim from which it depends is determined to be nonobvious.

Beer describes a package fabricated from a flexible sheet material capable of being sealed for closing off the interior of the package from ambient atmosphere. The package is designed to hold a non-frangible free flowing product. All examples given in Beer are of non-frangible products which are free flowing. Such examples include, "coffee (beans or ground), powdered drink mix, ready to eat breakfast cereal, lawn/garden chemicals, and the like." (See col. 3, lines 24-26). Therefore, when the term "ready to eat breakfast cereal" is taken in context with the like products listed above, it is clear to Applicant, as well as to those skilled in the art, that Beer intends to include only ready to eat breakfast cereals which are "like" the other products mentioned, namely non-frangible and free flowing (e.g., granola, grits, etc.). Beer is more than "silent" on frangible products as the Office Action suggests on Page 4, Beer does not teach or suggest any type of frangible products and therefore does not teach or suggest vacuum-packaging of frangible products. Therefore, any modification of Beer to include frangible products is done using the Applicant's invention as a roadmap.

Thompson ('990) does not overcome the deficiencies of the primary reference. Thompson ('990) involves a method for puffing a cereal product and discusses the various known properties of frangible cereal.

Francis also does not overcome the deficiencies of the primary reference. Francis discusses the crush resistance of both frangible and non-frangible products in relation to moisture content. There is no mention in Francis of the relation between crush resistance and vacuum packaging. Applicant also assumes the reference in the Office Action (page 4) to "Figure 5" of Francis is intended to be a reference to "Figure 15."

Maglecic also does not overcome the deficiencies of the primary reference. Maglecic concerns a vacuum packaging machine for non-frangible french fries. However, unlike the products of Beer, the french fries of Maglecic are not free-flowing and therefore do contain

significant voids. Therefore, the fact that the packaging of Maglecic can cause up to 30% more product to be contained therein is pertinent only to Maglecic and of no relevance to Beer. Clearly the products of Maglecic and Beer are fundamentally different from each other and such critical differences must be recognized. In re Bond, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990), *reh'g denied*, 1990 U.S. App. LEXIS 19971 (Fed. Cir.1990).

McCrosson (1923) also does not overcome the deficiencies of the primary reference. McCrosson discusses a vacuum container for cigars, cigarettes and smoking tobacco, i.e., non-frangible products which are non free-flowing. Clearly the products of McCrosson and Beer are fundamentally different from each other and such critical differences must be recognized. See In re Bond, *supra*.

Ylvisaker also does not overcome the deficiencies of the primary reference. Ylvisaker discusses a process and apparatus for forming, filling, sealing and deflating a package of goods. Ylvisaker actually appears to teach away from use of a vacuum-sealed package. For example, the “Background of the Invention” states, in pertinent part, “Another solution provided by the industry is a vacuum drawn on the inside of the package or container through the fill opening However, use of this system will slow the process due to the time required to evacuate gas from the fill tube. These systems also require the installation of equipment within the fill tube to close the tube off from the atmosphere. This additional equipment reduces the tube diameter which may cause plugging due to product bridging. (See col. 1, line 65 through col. 2, line 9). Again, the product in the primary reference and each of the products in the secondary reference are all fundamentally different from each other and such critical differences must be recognized. See In re Bond, *supra*.

The Examiner is also asked to consider the following: Those skilled in the art, and likely the general public, understand that breakage of non-frangible free-flowing products within a package, i.e., the type of products discussed in Beer, is of limited concern at best. What if a few pieces of coffee beans are broken off in a package? What if sugar crystals are broken into smaller particles? Indeed, Applicant can find no mention in Beer of any concern regarding providing a package that reduces breakage of the contents within. Therefore there is no suggestion in Beer *as to the desirability* of providing a package comprising a bag which

“becomes sufficiently rigid when vacuum-sealed to reduce breakage of an item contained therein,” as recited in claim 1.

Additionally, Applicant can find no mention in Beer of any desire or attempt to provide a vacuum-sealed package designed to be filled or capable of being filled with approximately 20 to 60% more material than a non vacuum-sealed package. Indeed, not only is there no suggestion in Beer as to the desirability of providing such a package, Beer clearly cannot accomplish filling a package with “approximately 20 to 60% more . . . material” as recited in claim 1, *since the contents of Beer’s packages are both non-frangible and free-flowing*, so are necessarily without the amount of void spacing required.

Therefore, whether or not the bags of Beer would have worked with the frangible products of Thompson (‘990), in combination with all the modifications and combinations suggested by the Examiner, is not relevant. Given that breakage of non-frangible free-flowing products generally, such as those in Beer, is of little, if any, importance, and the fact that the type of non-frangible products discussed in Beer already possess quite limited void spaces when not under vacuum, there is clearly no indication of any appreciation of the problem being solved by Applicant’s invention. When a person, having the references before him and not cognizant of Applicant’s disclosure, would not be informed that a problem (solved by Applicant’s claimed invention) ever existed, such references (which never recognized the problem) *could not have suggested its solution*. Combining references in this manner is improper. *In re Shaffer*, 229 F.2d 476, 108 USPQ 326, 329 (CCPA 1956). Focusing on the obviousness of substitutions and differences instead of on the invention as a whole is a legally improper way to simplify the difficult determination of obviousness. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ 81, 93 (Fed. Cir.1986). It is improper to pick and choose among the references to try to recreate Applicant’s invention.

Applicant is clearly not claiming to be the first to produce puffed food products. Applicant is also not claiming to be the first to provide a vacuum-sealed package. Applicant is the first, however, to provide, among other things, a package comprising a bag, wherein the bag becomes sufficiently rigid when vacuum-sealed to reduce breakage of an item contained therein, the item comprising a frangible puffed cereal-based material wherein vacuum-sealing allows the package to be filled with approximately 20 to 60% more cereal-based material as recited in claim

1. This is a surprising result. None of the references cited alone or in combination begin to teach or suggest such a combination, even going back to 1923. Indeed, the knowledge available to the general art worker teaches away from such an approach. See, for example, “Increasing food shelf-life by vacuum and gas packaging,” by Stanley Sacharew, *Packaging Technology*, May 1970, pp. 29-30 (attached hereto), wherein it states in pertinent part, “Fragile nut brittle cannot be vacuum packed in a flexible package because its sharp and hard corners may cause package damage. *In addition, vacuum may also cause breakage of the product. . . too soft products or fragile ones may also be crushed under the effect of a vacuum in a flexible package.*” (Emphasis added).

It is also not clear that such modification would be successful, but the mere fact that the prior art may be modified in the manner suggested by the Office Action does not make the modification obvious unless the prior art suggested the desirability of the modification. Clearly the prior art does not suggest such a modification. Additionally, motivation to combine the references must come from within the references themselves and cannot be generated by “hindsight or reconstruction.” In this instance, there is simply no suggestion or motivation, either in the cited references themselves or in the knowledge generally available to an art worker, to combine the reference teachings as suggested. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir.1988). Applicant requests the Office Action to either provide evidence of such motivation or withdraw this rejection.

Thus, the first requirement of the *prima facie* case has not been met: One skilled in the art would not have been motivated to combine the references as suggested by the Examiner, by replacing the non-frangible products of Beer with any type of frangible product. Indeed, conventional wisdom goes against making this combination as the results are quite surprising. Clearly Beer provides no teaching or suggestion that frangible products can be vacuum packed.

Additionally, the second requirement of the *prima facie* case has not been met: The combination of Beer and Thompson (‘990) together with the other references would not have provided one skilled in the art with a reasonable expectation that vacuum packaged frangible products would possess the elements recited in the claims, since the references are either silent on the features of a frangible product in a vacuum environment as recited in the claims or

otherwise teach away from such a combination. See, for example, Sacharew, supra. The additional references do not overcome any of these deficiencies for all the reasons stated above.

An additional requirement of the *prima facie* case is that the *references must teach or suggest all the claim limitations*. Since all of the elements of the claims are not found in the references, Applicant assumes the Examiner is taking official notice of the missing elements from an undisclosed source. Applicant respectfully objects to the taking of official notice, and pursuant to MPEP 2144.03, Applicant traverses the assertion of official notice and requests that the Examiner cite a reference that teaches the missing element. If the Examiner cannot cite a reference that teaches the missing element, Applicant respectfully requests that the Examiner provide an affidavit that describes how the missing element is present in the prior art. If the Examiner cannot cite a reference or provide an affidavit, Applicant requests withdrawal of the rejection and reconsideration and allowance of the claims.

Regarding claims 12 and 29, these claims depend directly or indirectly on claim 1. For at least the reasons noted above, Applicant submits that the cited combination does not teach or suggest each and every element of claims 12 and 29. In any case, these dependent claims include each limitation of claim 1 and are therefore also not obvious in view of the cited references.

Accordingly, Applicant respectfully submits that claim 1, and claims 10, 12, 15, 27-29, 41, 42, 59-61 and 65 which depend from claim 1, are patentably distinct from the cited references, either alone or in combination. Claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 viewed as a whole, are not suggested by the cited references, nor obvious under 35 USC 103(a). Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 further in view of Thompson ('990) and Francis and Maglecic and McCrosson and Yivisaker.

Claims 4 and 48

Claims 4 and 48 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as

applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 above, further in view of Ray (U.S. 370419). This rejection is respectfully traversed.

Applicant respectfully submits that claims 4 and 48 are allowable because they depend, directly or indirectly, on independent claim 1 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claims 4 and 48 are further allowable because Ray does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 4 and 48 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker, further in view of Ray.

Claims 49 and 50

Claims 49 and 50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259), further in view of Ray (U.S. 370419), as applied to claims 4 and 48 above, further in view of Ours et al. (U.S. 6,062,467). This rejection is respectfully traversed.

Applicant respectfully submits that claims 49 and 50 are allowable because they depend indirectly on independent claim 1 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claims 49 and 50 are further allowable because Ours does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker further in view of Ray.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 49 and 50 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker, further in view of Ray, further in view of Ours.

Claims 5-8, 13 and 14

Claims 5-8, 13 and 14 were rejected under 35 USC § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 above, further in view of Witkowski (U.S. 6,594,927 B2). This rejection is respectfully traversed.

Applicant respectfully submits that claims 5-8, 13 and 14 are allowable because they depend, directly or indirectly, on independent claim 1 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claims 5-8, 13 and 14 are further allowable because Galomb does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 5-8, 13 and 14 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker, further in view of Galomb.

Claims 9, 11, 33-35 and 37-38

Claims 9, 11, 33-35 and 37-38 were rejected under 35 USC § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 above, further in view of Galomb (U.S. 6,245,367 B1). This rejection is respectfully traversed.

Applicant respectfully submits that claims 9, 11, 33-35 and 37-38 are allowable because they depend, directly or indirectly, on independent claim 1 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claims 9, 11, 33-35 and 37-38 are further allowable because Witkowski does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 9, 11, 33-35 and 37-38 in view of

Thompson ('990) and Francis and Maglecic and McCrosson and Yivisaker, further in view of Witkowski.

Claims 16, 17, 21, 22, 43, 45-47 and 51-57

Claims 16, 17, 21, 22, 43, 45-47 and 51-57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 above, further in view of Thompson et al. (U.S. 2,478,438). This rejection is respectfully traversed.

Applicant respectfully submits that claims 16, 17, 21, 22, 43, 45-47 and 51-57 are allowable because they depend, directly or indirectly, on independent claim 1 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claims 16, 17, 21, 22, 43, 45-47 and 51-57 are further allowable because Thompson ('438) does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 16, 17, 21, 22, 43, 45-47 and 51-57 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Yivisaker, further in view of Thompson ('438).

Claim 24

Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 above, further in view of Kraft Foods Inc. (WO9812110). This rejection is respectfully traversed.

Applicant respectfully submits that claim 24 is allowable because it depends indirectly, on independent claim 1 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claim 24 is

further allowable because Kraft does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claim 24 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker, further in view of Kraft.

Claim 39

Claim 39 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 above, further in view of Hellweg et al. (U.S. 5,523,109). This rejection is respectfully traversed.

Applicant respectfully submits that claim 39 is allowable because it depends directly on independent claim 1 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claim 39 is further allowable because Hellweg does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claim 39 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker, further in view of Hellweg.

Claims 62-64

Claims 62-64 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as applied to claims 1, 10, 12, 15, 27-29, 41, 42, 59-61 and 65 above, further in view of Miyake et al. (U.S. 5,942,320). This rejection is respectfully traversed.

Applicant respectfully submits that claims 62-64 are allowable because they depend, directly or indirectly, on independent claim 1 which applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claims 62-64 are further allowable because Miyake does not cure the deficiencies discussed above with respect to the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 62-64 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Yivisaker, further in view of Miyake.

Claim 77

Claim 77 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259). This rejection is respectfully traversed.

The Office Action states that the references teach various aspects of claim 77.

Applicant again respectfully submits that the Examiner has not established the *prima facie* obviousness of the present claims.

The suggested combination does not teach or suggest the claimed invention for all the reasons stated above with respect to claim 1.

Once again, the methods and products in the primary reference and the methods and products in the secondary reference are fundamentally different from each other and such critical differences must be recognized. In re Bond, supra.

None of the references recognize the problem solved in the present invention and so can not suggest its solution. See MPEP 2141.01(a).

Motivation to combine the references must come from within the references themselves and can not be generated by "hindsight or reconstruction." In this instance, there is simply no suggestion or motivation, either in the cited references themselves or in the knowledge generally available to an art worker, to combine the reference teachings as suggested. Applicant again

requests the Examiner to either provide objective evidence of such motivation or withdraw this rejection.

Applicant is the first to provide a package comprising a bag formed of a material comprising a laminate, a co-extrusion of at least two materials or a combination thereof, the bag having an exterior portion, an interior portion, an oxygen barrier and a moisture barrier, wherein the bag becomes sufficiently rigid when vacuum-sealed to reduce breakage of an item contained therein, the item comprising an expanded frangible oat-based cereal material with a crush resistance or resistance to compression no less than about 7.0 PSIA, the item held in the interior portion of the bag, the interior portion of the bag having less than about 1 ppm hexanal therein, wherein vacuum-sealing allows the package to be filled with approximately 20 to 60% more oat-based cereal material as recited in claim 77.

Accordingly, Applicant respectfully submits that claim 77 is patentably distinct from the cited references, either alone or in combination. Claim 77, viewed as a whole, is not suggested by the cited references, nor obvious under 35 USC 103(a). Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Claims 78-79

Claims 78-79 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (U.S. 6,213,645 B1) in view of Thompson et al. (U.S. 3,246,990) and Francis and Maglecic et al. (U.S. 5,473,866) and McCrosson (U.S. 1,458,585) and Ylvisaker et al. (U.S. 4,964,259) as applied to claim 77 above, further in view of Hellweg et al. (U.S. 5,523,109). This rejection is respectfully traversed.

Applicant respectfully submits that claims 78-79 are allowable because they depend directly on independent claim 77 which Applicant submits is allowable for the reasons stated above. If an independent claim is allowable, then any claim depending there from is allowable. Claims 78-79 are further allowable because Hellweg does not cure the deficiencies discussed above with respect to either the combination of Beer in view of Thompson ('990) and Francis and Maglecic and McCrosson and Ylvisaker.

Applicant thus respectfully requests reconsideration and withdrawal of this rejection under 35 USC 103(a) over Beer as applied to claims 78-79 in view of Thompson ('990) and Francis and Maglecic and McCrosson and Yivisaker, further in view of Hellweg.

CONCLUSION

As a result of the Interview between the Examiner, Applicant's Representatives, Barbara J. Clark and John O'Toole, on January 25, 2005 and the preparation of the agreed-upon amendments in the subsequent Amendment and Response, Applicant understood that a Notice of Allowance was a distinct possibility, or, at most, that only minor issues remained. Indeed, all previous rejections have been overcome. Although it was understood a new search would be performed, a 24-page Final Office Action, with references dating back to 1923, was certainly not anticipated. Applicant has hereby addressed the newest concerns of the Examiner and firmly believes that all of the claims are in condition for allowance. If, upon review of the foregoing, the Examiner is still not convinced that the pending claims are in condition for allowance, the courtesy of an Examiner's Interview, to include Applicant's Representatives, Barbara J. Clark and John O'Toole, and the Examiner's Supervisor, Milton Cano, is respectfully requested prior to preparing and mailing an Advisory Action.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 - EXPEDITED PROCEDURE

Serial Number: 09/945,318

Filing Date: August 31, 2001

Title: VACUUM-SEALED PACKAGE CONTAINING FRANGIBLE MATERIALS (AS AMENDED)

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Dkt: 869.021US1

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. Again, the Examiner is encouraged to telephone Applicant's Representative, Barbara J. Clark, at 515-233-3865 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

WAYNE I. KNIGGE ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, MN 55402
515-233-3865

Date AUGUST 19, 2005

By Barbara J. Clark
Barbara J. Clark
Reg. No. 38,107

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop AF, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 19 day of August, 2005.

KATE GANNON

Name

Kate G

Signature

**PACKAGING
TECHNOLOGY**

Increasing food shelf-life by vacuum and gas packaging

By Stanley Sacharow

VACUUM PACKAGING has been used for many years with hermetically sealed metal and glass containers. It is not a new process nor is it a unique method of extending shelf-life. By drawing a vacuum on a metal can or glass jar, certain chemical changes in the food contained in the container are inhibited. Fat rancidification is reduced and mold growth retarded. The same effect is obtained by evacuating a flexible package containing many confectionery products.

In vacuum packaging techniques, either pre-made pouches or rollstock on "form-fill" machines can be used. The package to be sealed is completely enclosed in a chamber. The chamber is then evacuated and the package sealed prior to its release from the chamber. After sealing, the chamber is opened, air enters and the vacuum pack is released.

It is important to note that the vacuum level used must reduce the amount of oxygen in the package to a level below that which will cause spoilage. For most foods, a vacuum level of 20 mm is a good starting point for experimentation. Since foods are complex products, each item must be tested for adequate vacuum level prior to reaching the final decision.

ADVANTAGES — DISADVANTAGES

In addition to the delay of spoilage due to oxidative rancidity and the inhibition of mold growth, a vacuum pack offers a tight package. The net result is a more rigid container which prevents movement of the product within the package.

Also, any tendency for the product to cause condensation underneath the packaging material is minimized. Other advantages of a vacuum pack include the prevention of weight loss and a handy means of checking whether or not the package is sealed.

For certain products — containing sharp corners or soft and irregular



Stanley Sacharow

Stanley Sacharow is project director, laminated products, Reynolds Metals Co., Richmond, Va., and a recognized North American packaging authority.

shaped — a vacuum pack is not advisable. Fragile nut brittle cannot be vacuum packed in a flexible package because its sharp and hard corners may cause package damage.

In addition, vacuum may also cause breakage of the product. External abuse damage may become a problem due to the strains imposed on the material due to creases. Too soft products or fragile ones may also be crushed under the effect of a vacuum in a flexible package.

An inherent problem with flexible vacuum packs is their appearance — which is often wrinkled and distorted. For the latter reason, many vacuum packs are sold in outer paperboard cartons. Foods containing loosely bound fats or other liquids may be affected under vacuum by seepage of liquid from the interior of the product.

MATERIALS

The flexible packaging material se-

lected for a vacuum pack must be stronger than the corresponding gas pack. Greater mechanical performance is needed in order to prevent damage from sharp or irregularly shaped products.

Even though unsupported plastic films such as nylons and vinylidene chloride copolymers can be used, the definite trend in vacuum packaging materials is toward composite laminations of paper, film and foil. By utilizing a laminate a certain degree of "built-in chemistry" is obtained. The required barrier properties are selected, reverse-printing is possible, and high-speed machinery can be used in the production line.

One of the primary aims in selecting suitable material is that it be capable of preventing oxygen permeation into the package. Permeability levels of less than 5 cc of oxygen/100 sq in.-day per atmosphere pressure differential are preferred.

For all laminations, an oxygen barrier and heat-sealing media are required. Aluminum foil is widely used as the barrier component of many opaque laminates. When laminated to a protective outer layer and an inner heat-sealable layer, foil becomes strong, tough and capable of meeting the oxygen barrier requirements of a vacuum package.

One area often mentioned in using aluminum foil laminates is pinholes. In the gauges often used for packaging, aluminum foil does contain pinholes caused during manufacture or storage. By coating the foil with a heat-sealable film such as polyethylene, these pinholes are effectively blocked and gas transmission is negligible. An outer layer is also needed to provide strength.

Paper, cellophane, polyester, polypropylene, or nylon can be used to provide the ultimate paper/foil/PE or film/foil/PE laminate. Since vacuum packaging requires a tough laminate, the use of a paper/PE/foil/PE or

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film/PE/foil/PE is preferred. The substitution of an adhesive layer with PE provides a laminate capable of better resisting creasing and damage from the product.

Transparent laminations are usually composed of an inner layer of polyethylene combined with an outer layer of either cellophane, polypropylene, polyester, or nylon. The addition of PVDC coating on one of the films is normally preferred for superior barrier properties.

MACHINES AND COST

A wide range of semi-automatic and automatic machinery is available for vacuum packaging. Speeds up to 80 packages per minute are possible. The best machines incorporate close temperature control, seal placement control and satisfactory package disposal features.

It is obviously more expensive to utilize a vacuum package as opposed to an atmospheric package. The cost per 1,000 sq in. of a paper/PE/foil/PE ranges between 13c and 14c. For a film/PE/foil/PE laminate, the cost is higher and may reach upwards of 26c. These prices are general values and are affected by volume of material used as well as specific materials.

For example, a cellophane/PE/foil/PE laminate averages 17c/1,000 sq in. Transparent laminates are also priced within the same range depending on the specific films used in the construction.

Machine prices vary depending on the specific model desired. A single-head unit which is capable of evacuating and sealing preformed pouches may cost between \$4,500 and \$6,500. For a continuous-motion machine capable of using rollstock, prices of \$100,000 are possible.

Many Canadian companies market a range of vacuum packaging machinery for use in the food industry. These include Paul Moore Company Ltd., Toronto (Bartelt type horizontal packagers); Austin Bond, Toronto (FMC Corp. machines); Packaging Equipment Service Ltd., Willowdale, Ont. (Hesser machines); Tekpak, Toronto (Hayssen machines); and Delamere and Williams, Ont.

GAS PACKAGING

The packaging of foods in an inert gas offers a means of providing low oxygen tension without imposing a high internal vacuum. Spoilage is de-

layed, mold inhibited, and oxidative rancidity retarded.

Just as with vacuum packaging, inert gas packaging has been used with glass jars and metal cans. It is now used considerably with flexible packages of many different food products.

In most gas packaging operations, either pre-made pouches or rollstock can be used. The package is made and filled in a concentrated atmosphere of an inert gas. Although the best method would be to store the product in an inert gas atmosphere from arrival until packaging, this is often not practical.

Two gases may be used for gas packaging. Nitrogen is usually preferred since it is a true inert gas and is less soluble than carbon dioxide. Carbon dioxide is used for some food products. Excellent protection is offered against oxidation. Disadvantages include the inherent solubility of carbon dioxide in water; it dissolves, yielding an acidic taste. This causes solution of the gas in the aqueous phase yielding lower internal pressure within the package. Because carbon dioxide is not essentially inert, it is not recommended for products with high aroma.

Neither nitrogen nor carbon dioxide will retard bacterial decay once decay has begun. In selecting nitrogen for gas packaging, an extremely high purity grade is essential. The most suitable type is water pumped high purity nitrogen.

ADVANTAGES — DISADVANTAGES

Gas packaging is particularly useful for packing fragile products. Soft foods may "squash" under the effect of a vacuum draw. Fragile items are not damaged and the tendency for package damage is reduced.

On the other hand, the resultant package is loose and may be difficult to ascertain whether it is a "leaker". It may be necessary to hold the packages for a period of time to determine that they have been correctly sealed.

For nuts, carbon dioxide is unsuitable and the application of vacuum causes nut breakage. Nuts tend to absorb carbon dioxide and yield a difference in partial pressure. A vacuum forms inside the package resulting in nut fracturing.

An additional retarding factor is that many packaging films are more permeable to carbon dioxide than oxygen. Nitrogen packaging is the most

feasible method of extending the storage life of nut meats.

MATERIALS

The materials used in gas packaging are similar to those necessary in vacuum packaging. In general, a less durable material may be satisfactory since the resultant package is not a "tight" one.

MACHINES AND COST

One of the earliest machines available for gas packaging consisted of a chamber capable of equalizing air pressure on the inside and outside of a package. This type of machine is still widely used. Premade pouches are employed, the produce inserted and a vacuum is drawn. Gas flushing is accomplished through nozzles inserted into the mouth of the pouch. The pouches are heat sealed and the chamber is opened. Variations include direct filling with an inert gas and the elimination of the vacuumizing step.

In "form-fill" machinery, a formed tube is made from the packaging material. The product is enclosed and initial heat seals are made. A tunnel is used around the area where the tube is formed. The inert gas enters through a nozzle into the package.

A variation consists of using two rolls of material to form a flexible pouch. The latter involved a thermoforming operation in which bottom pockets are thermoformed, filled and sealed after the unit is evacuated and gassed.

Recently, development has increased in the area of controlled atmospheric packaging. The product passes through a nitrogen atmosphere and is loaded in another nitrogen filled atmosphere. Special equipment is necessary and may become expensive.

Because the materials used for gas packaging are priced the same as those for vacuum packaging, the inherent difference is machine cost. Gas packaging machines generally are cheaper than vacuum equipment.

For \$14,000 to \$16,000 a vertical-tube pouch machine can be obtained to handle gas packaging. Two tubes inside one another are required and the inert gas is flushed in the space between the tubes. This results in a low pressure back-flow up the filler tube on the inside. The product fills into the inert atmosphere instead of the atmosphere.

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PACKAGING

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It is important to note that a machine capable of gas packaging should be ordered direct from the manufacturer instead of attempting to convert it in-plant. The results of an internal conversion are often disastrous.

Many of the same Canadian firms marketing vacuum packaging machines offer a range capable of gas packaging. Often the same machine can be adapted for both processes. The Hesser "Duomat" can be purchased with both vacuum and gas attachments (Packaging Equipment Service Ltd., Willowdale, Ont.) The Hayssen machines (Tekpak, Toronto) are capable of gas flushing.

GAS VS VACUUM

The final choice between gas and vacuum is based on economics, machine availability and specific product to be packaged. The overall machine speeds of an atmospheric packaging operation vs. a vacuum or gas operation are not drastically different. Differences between the two methods are based on material and machine cost.

While the cost of using a cellophane overwrap involves a 3c to 4c/1,000 sq in. factor, the use of cellophane/PE/foil/PE involves 17c

1,000 sq in. This price differential can only be absorbed by increased product shelf-life, reduced inventory and less field complaints.

By studying each of his products produced, a food processor can decide whether conversion to vacuum or gas is worthwhile.

Fill-seal equipment

The Mini PF 233, two interdependent machines that link four packaging operations on PVC and other plastics (thermoforming, filling, heat sealing and trimming), was shown by the Haring Equipment Co.

The unit acts with a rotary movement to insure sealing and trimming of thermoformed plastics, while its weld is realized with a thermally regulated generator.

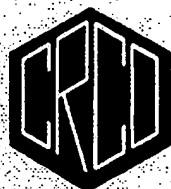
The machine's drum is coated with specially designed heat resistant rubber to allow manual and individual regulation of sealing pressure.

By simple adjustment, with suitable tools, the machine's clipper can be replaced to produce objects with rounded corners and strips in any quantity desired.

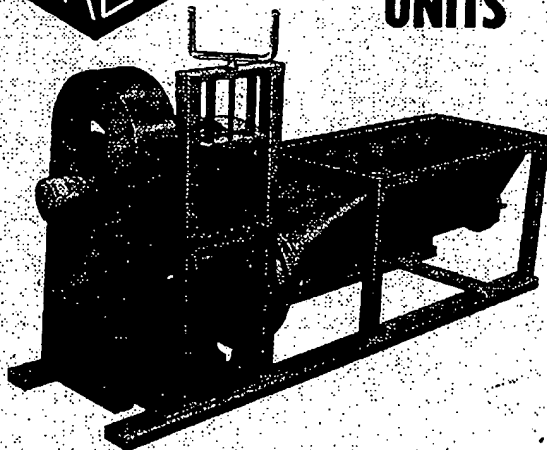
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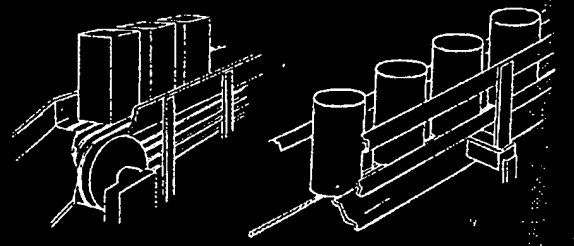


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